

more particularly on the contrast presented by the large grants that had been made by Government to other Antarctic expeditions, and the entire lack of recognition, so far, of the work of proved value that had been done by Dr. Bruce.

Prof. J. Cossar Ewart, F.R.S., professor of zoology in the University of Edinburgh, then commented on the zoological value of Dr. Bruce's expeditions, which had been the means of adding dozens of new species to scientific knowledge, and on that account gave his cordial support to the carrying out of this second Scottish Antarctic Expedition. In an eloquent speech Prof. D'Arcy W. Thompson, C.B., of the Scottish Fishery Board, professor of zoology in University College, Dundee, expressed warm appreciation of the work that Dr. Bruce had already done in his previous expeditions. Mr. Chisholm, lecturer on geography, Edinburgh University, recommended Dr. Bruce's plans to the support of the meeting, among other grounds, on account of the fact that Dr. Bruce had shown his qualifications as a leader by the attachment and devotion which he inspired in his followers, and this point was immediately enforced by Dr. R. N. Rudmose Brown, lecturer on geography in the University of Sheffield, who had accompanied him in expedition after expedition.

At the close of the meeting, on the motion of Mr. W. G. Burn-Murdoch, a resolution asking the meeting, as a representative Scottish gathering, to express their hearty desire to have Dr. Bruce's plans carried out, was unanimously approved. It should be added that, while the opinion that it was the duty of the Government to contribute to the publication of the results of the *Scotia* expedition was very freely expressed at the meeting, the appeal for funds to carry out the present projected expedition is not made, in the first instance at least, to the Government, but to "the enthusiasm and patriotism of Scots at home and abroad."

PROF. J. CAMPBELL BROWN.

AS recorded with regret last week, Prof. James Campbell Brown, professor of general chemistry at the University of Liverpool, died very suddenly from heart failure on Monday, March 14. Prof. Campbell Brown, who was the son of the late Mr. George Brown, a chemical manufacturer with a business in London, was born in Aberdeenshire in 1843. He studied at the University of Aberdeen, and afterwards at the Royal College of Chemistry and the Royal School of Mines, London. He was a D.Sc. of London University, and LL.D. (*honoris causa*) of the University of Aberdeen. His connection with Liverpool began in 1867, when he was appointed lecturer in chemistry and toxicology at the Royal Infirmary School of Medicine. He became public analyst for Liverpool in 1872, for Cheshire and the Isle of Man in 1873, and for Lancashire in 1875. In 1877, being then chairman of the Royal Infirmary School of Medicine, he took a prominent part in the movement for the foundation of a university college in Liverpool, and from 1878 to 1884 was one of the secretaries of the special committee which afterwards became the council of the new college. Prof. Campbell Brown may, therefore, rightly be said to have been one of the prominent founders of the present University of Liverpool. In 1881 he was appointed to the chair of chemistry endowed by Mr. Grant, of Rock Ferry. When death overtook him he was still the active occupant of this chair.

For more than forty years Prof. Campbell Brown exercised an important and beneficial influence on higher education, and especially higher scientific education, in this country. In Liverpool in particular he developed a flourishing department of chemistry, and was very successful in enlisting the

sympathy and obtaining the aid of the chemical manufacturers of Lancashire and Cheshire. As a public analyst of experience and repute he did much for the improvement of our methods of suppressing the falsification and adulteration of foods and drugs.

In 1874 he published a report on the chemistry of tea cultivation in India, and made important recommendations which proved of great value to that industry.

He contributed a very considerable number of papers to the scientific journals, and was awarded two gold medals by the Franco-British Exhibition. In this connection his excellent work on the latent heats of evaporation of liquids deserves special mention. Quite recently he contributed a paper to the Chemical Society dealing with double and triple ferri-cyanides.

In 1908 he was elected a vice-president of the Chemical Society. A man of genial, kindly, and unselfish nature, his heart was entirely in the work to which his life was devoted. He lived to see his labours crowned with a well-deserved success. The University of Liverpool owes him a debt of gratitude which few can appraise, and it stands to-day a memorial of his wisdom and foresight, his marvellous power of organisation, and his profound belief in the value of the investigation and dissemination of knowledge and truth.

F. G. D.

NOTES.

SIR WILLIAM RAMSAY, K.C.B., has been nominated "Membre d'Honneur"—honorary member—of the Chemical Society of France.

SIR THOMAS BARLOW, F.R.S., has been elected president of the Royal College of Physicians, London, in succession to Sir Richard D. Powell.

THE Aldred lecture of the Royal Society of Arts will be delivered by Prof. H. H. Turner, F.R.S., on Wednesday, May 4. The title of the lecture is "Halley and his Comet."

THE death is announced, in his seventy-second year, of Dr. Otto Hermes, founder of the Berlin Aquarium. Dr. Hermes was appointed director of the aquarium in 1871, and was known by his writings on zoological subjects.

AMONG the latest developments of Germany's airship movement we notice the fund raised by Prince Henry of Prussia for the building of a dock at Hamburg capable of housing at least two Zeppelins. Of the 50,000*l.* required, 20,000*l.* was raised almost immediately.

A YOUNG horn of *Cervus megaceros* has been dug up recently from a depth of 2 or 3 feet below the surface of Martin Mere, near Southport, in Lancashire. It is the property of the Rev. Mr. Bulpit of that town, by whom the specimen has been submitted for determination to the director of the Liverpool Museums.

THE following awards of the Royal medals and other honours have been made by the council of the Royal Geographical Society:—Royal gold medals: founder's medal, Colonel H. H. Godwin Austen, C.M.G., F.R.S.; patron's medal, Dr. W. S. Bruce; Murchison grant, Dr. Carl Skottsberg; Gill memorial, Mr. D. Carruthers, for his journey in north central Arabia; Cuthbert Peek grant, Lieut. C. E. Fishbourne, R.E.; Back bequest, Mr. H. Vischer. A special medal has been awarded to Rear-Admiral Peary for his attainment of the North Pole.

By the death of Prof. J. Edmund Wright, of Bryn Mawr College, a young mathematician of great promise has been lost. Prof. Wright graduated at Trinity College, Cambridge, being senior wrangler in 1900, subsequently taking a first in "part two" and obtaining a Smith's prize. He was in 1903 appointed associate professor in Bryn Mawr College, in succession to Prof. Harkness. He was the author of a "Cambridge Tract" on "Invariants of Quadratic Differential Forms," and he also wrote on theory of groups, differential geometry of space, and Abelian functions.

SIR FREDERICK MAPPIN, BART., whose death at the age of eighty-nine years took place on March 19, was an active friend of higher education in Sheffield. He took a very prominent part in founding the Sheffield Technical School, which later formed an important part of the University College, and is now merged in the University of Sheffield. He contributed generously towards the support of these institutions, and at the time of the foundation of the University gave 15,000*l.* to its fund. He was one of the first two Pro-Chancellors of the University, and was also chairman of its department of applied science.

AN International Hygiene Exhibition is to be held in Dresden next year. At a meeting of members of the British executive committee of the exhibition, held on March 16 at the Hotel Cecil, Prof. Pannwitz, the deputed representative of the scientific department, delivered an address. He explained the aims and objects of the exhibition, the support which is being extended by the German Imperial and State Governments, the efforts which many civilised countries are making to secure an effective representation, and he concluded by expressing his full confidence that the British representation will be in every respect worthy of the country which is the acknowledged birthplace of sanitary science. Offices are to be opened in Victoria Street, S.W., for the accommodation of the British executive and for the general working of the undertaking in this country.

THE sixty-third annual meeting of the Palæontographical Society was held at Burlington House on Friday, March 18, Dr. Henry Woodward, F.R.S., president, in the chair. The report of the council referred to the progress of the monographs on Pleistocene Mammalia, Cretaceous and Carboniferous fishes, and Cretaceous Lamellibranchia, and recorded the gift of a series of plates of Carboniferous fishes by the Carnegie Trust for the universities of Scotland. It lamented the death of two members of council during the past year, the Rev. G. F. Whidborne and Mr. C. Fox-Strangways. Miss M. S. Johnston, the Rev. R. Ashington Bullen, Dr. F. L. Kitchin, and Mr. A. W. Oke were elected new members of council. Dr. Henry Woodward, Dr. G. J. Hinde, and Dr. A. Smith Woodward were re-elected president, treasurer, and secretary respectively.

FROM the *Deutsche Zeitschrift für Luftschiffahrt* we learn with deep regret of the death of the founder and editor of that journal, Lieut.-General H. W. L. Moedebeck. The name of Moedebeck figures prominently in the annals of German aeronautics, and even the published records which reach this country afford evidence of the powerful influence of his personality in stimulating aeronautical enterprise. He is described as a man possessing ideas, not only for the requirements of the day, but for developments of the future. Before airships were thought of he devised methods of preventing explosions in motors, and his geographical surveys were also initiated, in the face of con-

siderable opposition, before the demand for them had arisen in connection with aerial navigation. In 1884 he was first appointed by the German Government to develop the balloon for military purposes. He has published a hand-book and a pocket-book of aeronautics, of which the latter is now well known in this country. His works on "Airships: their Past and Future," and on flying men, have done much to popularise aeronautics; but perhaps the two things which stand out most prominently as his life-work have been the *Deutsche Zeitschrift* and the aeronautical map brought out in connection with the above-mentioned survey. The part which Moedebeck played in developing the "Zeppelin movement," especially at a time when the Count had few supporters, is also worthy of note.

NEARLY thirty years ago, the sanction of Parliament was given to a scheme to obtain an adequate water supply for Liverpool from the Welsh hills. This undertaking was completed on March 16, when the Prince of Wales visited Lake Vyrnwy and turned on into the great artificial lake there the water collected from the Marchnant River. The complete scheme for the water supply of Liverpool outlined by Messrs. G. F. Deacon and T. Hawksley comprised the impounding of the rivers Vyrnwy, Marchnant, and Afon Cownwy. The two latter are higher than the former, and the work in connection with them was carried out after the Vyrnwy scheme was finished. In the cases of Afon Cownwy and Marchnant the rivers were dammed, and tunnels cut through the intervening hills so that the impounded water could empty itself into the Vyrnwy. The Afon Cownwy tunnel was 7 feet in diameter and 6723 feet in length, and the Marchnant tunnel 7 feet in diameter and 7345 feet in length, and it was at the latter one that the Prince of Wales opened the valve which allowed the water to flow through the tunnel into the Vyrnwy lake, thus completing the whole scheme. The completed scheme as it now stands has a gathering ground of 22,742 acres, and the capacity of Vyrnwy lake is 12,131 million gallons; its greatest depth is 84 feet; the area of its surface is 1121 acres, and its length $4\frac{1}{2}$ miles. The surface-level of the lake above the sea is 825.89 feet Ordnance datum, and the level of the highest point in the watershed is 2050 feet Ordnance datum. The water engineer of Liverpool, Mr. Joseph Parry, has been entirely responsible for the work in connection with the Marchnant and Afon Cownwy rivers.

THE last Bulletin, that for March 10, of the Institution of Mining and Metallurgy contains the annual report of the council, which deals with the work of the year 1909. The gold medal of the institution has been awarded to Prof. William Gowland, F.R.S., in recognition of his services in the advancement of metallurgical science and education during a long and distinguished career. "The Consolidated Gold Fields of South Africa, Ltd.," gold medal has been awarded to Mr. W. A. Caldecott, in recognition of his work in the investigation of methods of reduction and treatment of gold ores and of his contributions to the literature of the subject. "The Consolidated Gold Fields of South Africa, Ltd.," premium of forty guineas has been awarded conjointly to Messrs. C. O. Bannister and W. N. Stanley, for their work in the investigation of the thermal properties of cupels and for their joint paper on "Cupellation Experiments—the Thermal Properties of Cupels." Four post-graduate scholarships, each of 50*l.* in value, have been awarded. The total membership of the institution at the end of the year under review was 1902, which represents an actual increase of 277 in two years.

GERMAN geology has sustained a serious loss by the death of Dr. Emil Philippi, extraordinary professor of geology at Jena, who is best known as the geologist with the German Antarctic Expedition under Prof. von Drygalski. He had been from 1901 to 1906, except during his absence with that expedition, a privat-docent in Berlin. In 1906 he was called to Jena to succeed Prof. J. Walther as assistant to Prof. Lenck. Dr. Philippi will be best remembered by his contributions to the geology of the Gaussberg, beside which the *Gauss* wintered in the Antarctic; they and his memoir on the islands visited on the voyage have been reviewed in NATURE. His other contributions are mainly on problems connected with glacial geology. He was especially interested in faceted stones, which he discovered both in the drifts of north Germany and in Antarctic icebergs. He seemed disposed to regard faceted stones in general as due to ice work. He published in 1908 a short memoir on the Upper Palæozoic glaciation of southern Africa and Australia, for which he accepted a Permian date. He accompanied the Geological Congress in its excursion to Mexico in 1906, and subsequently wrote an account of the tectonic effects of the intrusion of the syenite porphyry of Cerro Muleros. His premature death in Egypt has cut short a career of great promise.

THE Premier (Transvaal) Diamond Mining Company recently presented to the British Museum (Natural History) an interesting series of specimens from the Premier Mine, near Pretoria. The examples of diamondiferous rock which come from different depths, ranging from 15 to 160 feet below the surface, exhibit very clearly the change that takes place in the colour and texture as the depth increases; the specimen, orange in colour and powdery in character, which came from the shallowest depth, is in marked contrast with that, bluish and hard, which was taken from the lowest depth. The series of rough diamonds, eighteen in number, and nearly 9 grams, or 29 carats, altogether in weight, gives an idea of the variation possible in the form, transparency, and colour of the stones found in the mine; thus there are a clear white octahedron and a black opaque boart, a tetrakis-octahedron, nearly spherical in shape, and a flat, triangular twin, and yellow, pink, and brown stones. Examination in polarised light shows that most of the diamonds are in a state of strain. A specimen of "blue ground" out of which emerges a diamond is of especial interest, because it so rarely happens that the rock is split just where a diamond chances to be. The series includes also specimens of the associated minerals, pyrites, calcite, and "Cape-ruby" (pyrope-garnet).

GREAT efforts are being made by the committee, of which Lord Desborough is chairman and Mr. C. E. Fagan secretary, to render the British big-game section at the forthcoming Vienna Sports Exhibition a success. His Majesty the King, who has given directions that the skeleton of his famous thoroughbred Persimmon should be sent, is taking great personal interest in the matter; and the trustees of the British Museum have placed the services of a portion of the staff of the Natural History Branch at South Kensington at the disposal of the committee. One of the special objects of this section is to exhibit a representative series of trophies of the big-game animals found in the British Empire (inclusive of protected States). The number of such species, according to a provisional list drawn up for the committee by Mr. Lydekker, is about 165, but many of these are represented by two or more local races. A number of sportsmen and other owners of trophies of this nature have been asked to lend specimens, especially

those approaching or representing the "record," and the replies have been, on the whole, of an encouraging nature, the names of those who have promised to lend specimens including the King, the Prince of Wales, the Duke of Westminster, Lord Lansdowne, Mr. Chas. Lucas, and a number of well-known big-game sportsmen. It is also intended to exhibit specimens of the game mammals, birds, and fishes of the British Isles. A photograph of the picturesque building intended for the reception of the British trophies appears in the *Field* of March 19, accompanying a letter from Lord Desborough. The main difficulty is the shortness of the time available, the exhibition opening in May.

WHEN the Aërial League was founded, an excellent opportunity was afforded to the British public to retrieve the reputation implied in the words "England's Neglect of Science"; but in an article in the *Standard* (March 14) Captain Cave Browne draws a striking comparison between the support which this movement has obtained and the reception accorded to similar efforts abroad. He says:—"In Germany up to last year the public had subscribed 330,000l. towards the building of an aërial fleet. The Government has made grants amounting to 250,000l. The Aërial League, founded in 1908, has attained a vast membership; a practical school of aëronautics has been founded at Friedrichshafen, and a chair of aëronautics at Göttingen University; the wharves, docks, aluminium foundry, hydrogen factory, and large construction yards which have been built at Friedrichshafen are capable of turning out six complete Zeppelins annually, while the output of Gross, Parseval, and other equally successful types of military dirigibles is practically unlimited. In France Government lands have been placed at the disposal of pioneers of flight; great public subscriptions have been raised. Prominent men like Messrs. Deutsch, de la Meurthe, Basil, Zaharoff, and Archdeacon have come forward from time to time with munificent gifts, aggregating over 100,000l., for the foundation of aërotechnical institutions, for scientific research work and tuition in aëronautics, for special prizes and the encouragement of inventors. A college of advanced aëronautics has been inaugurated at Paris for the theoretical and practical training of aviators. The French Aërial League, with a membership well over 10,000, has courses of study and practical work at its Juvisy flying ground. In England the Aërial League has been formed, but the appeal to the British people has produced little result."

WE regret to record the death, on March 6, of Mr. Charles Fox-Strangways. Born in 1844 at Rewe, near Exeter, where his father, a grandson of the first Earl of Ilchester, was rector, Mr. Fox-Strangways was educated at Eton and afterwards at Göttingen, where he studied mineralogy, chemistry, and physics. In 1867 he was appointed an assistant geologist on the Geological Survey under Murchison, and was engaged for some years in mapping parts of the Yorkshire coal-field, the country around Harrogate, and a large area extending across the Vale of York to the Jurassic and Cretaceous rocks of the east Yorkshire moorlands, and the coast near Scarborough. He was author, or part author, of several memoirs, notably one on the geology of Harrogate, of which a second edition was published in 1908. His chief publication was a general memoir on the Jurassic rocks of Yorkshire, published in two volumes, 1892. In 1889 Mr. Fox-Strangways was transferred to the Midland district, residing for many years at Leicester while engaged in surveying the Leicestershire coal-field and bordering areas. He was author of

memoirs on that coal-field, and on the country around Derby, Burton-on-Trent, Atherstone, Charnwood Forest, and Leicester. In 1901 he was promoted to be district geologist, but retired from the public service in 1904, as a weakness of the heart, which ultimately proved fatal, rendered it necessary to give up the arduous work of a field-geologist. His geological labours, represented by official maps, sections and memoirs, and by papers communicated to scientific societies, bear evidence of the most painstaking care and accuracy. While at Leicester Mr. Fox-Strangways did much to promote local interest in geology, especially by conducting field-excursions, which were highly appreciated.

ACCORDING to a telegram from Paris in the *Times* of March 13, an International Congress for the Study of Cancer will be held in that city, under the patronage of the President of the Republic, in the first week of October. The assemblage will not be a congress in the true sense; its official title is "Second International Conference for Cancer Research," the first meeting of the kind having been held in Heidelberg in 1906, as the outcome of which a sort of international association has developed. From this association, however, British investigators have hitherto held aloof, notwithstanding efforts that have been made from Berlin to induce the Imperial Cancer Research Fund—which is the national and representative body in this country—to join. These efforts have taken the form of questions addressed to the Prime Minister in the House of Commons, and even went so far as the presentation of a petition to the King during his visit to Berlin in February, 1909. The German organisers of the so-called international association have used their best efforts to have the first International Congress on Cancer held in London in 1910; but this proposal was discountenanced by the director of the Imperial Cancer Research Fund, Dr. E. F. Bashford, and the executive committee, on the ground that the time for such a congress had not yet arrived. It was felt that such a congress held in London under the auspices of the Imperial Cancer Research Fund, backed as it is by the support of various Government departments, the Royal Society, the Royal Colleges of Physicians and Surgeons, and other public bodies, would arouse too great expectations on the part of the public. The programme for the forthcoming meeting in Paris covers a wide range of subjects, but in the absence of the names of those contributing papers it is too early to decide what importance will attach to the assembly. The list of office bearers given in the *Times* exhibits the remarkable feature of not including a single name of an active worker in those fields of cancer research which are the direct contributors to the success attending the investigations of the past ten years. However distinguished some of these names are in the realms of practical medicine and surgery, they add little, if any, weight to the purely scientific side of an assembly called together to study so recondite a problem as cancer.

DR. LUIGI PERNIER, under the title of "Vestigia di una Città Ellenica arcaica in Creta," has issued, through the Istituto Lombardo di Scienza e Lettere, an account of a summary examination of an early Greek city in Crete. It is surrounded by walls of cyclopean masonry, now partially ruined. Some inscribed stones and terra-cottas were discovered, the most interesting find being a stele representing a standing figure facing to the right, clad in a tightly folded robe, and holding in the left hand something resembling the Egyptian Ankh. The figure possibly shows the influence of Minoan traditions, and the site clearly deserves further detailed examination.

NO. 2108, VOL. 83]

MAJOR LAMB, I.M.S., and Captain McKendrick, I.M.S., detail certain observations on rabies in the Scientific Memoirs of the Government of India (No. 36). They find that when the "natural" virus is passed through dogs a "fixed" virus is obtained just as with rabbits, and that the structures known as "Negri bodies," while easily demonstrable in the natural virus, cannot be found in the fixed virus. In several cases, both in dogs and in rabbits, a chronic form of rabies was observed, the chief symptom of which was progressive emaciation. It is comparatively easy to infect guinea-pigs and monkeys by subcutaneous inoculation of the virus. As in monkeys the incubation period is much prolonged when the inoculation is subcutaneous, attempts were made to immunise these animals with a single subcutaneous inoculation with a fixed virus, but without success. No bacteriolytic properties towards the virus could be detected in the serum of patients who had undergone the anti-rabic treatment.

FISHERIES, IRELAND, SCI. INVEST., 1908, iv. (1910), is devoted to an account, by Messrs. E. W. L. Holt and L. W. Byrne, of the chimæroid fishes of the Atlantic slope off the west coast of Ireland. The most interesting of these is *Rhinochimaera atlantica*, a long-beaked species known by a single adult male captured at a depth of between 670 and 770 fathoms, and certain egg-capsules attributed to the same species, which was first named by its describers in 1909. *R. atlantica* belongs to a genus otherwise represented by *R. pacifica*, distinguished by the relative shortness of the base of the second dorsal fin. The only Atlantic chimæroid with which *R. atlantica* could be confounded is *Harriotta raleighana* of the western Atlantic; the largest of the four known specimens of the latter is, however, not more than half the size of the type of the former, which, in turn, is decidedly smaller than its Pacific representative. *Harriotta* is also otherwise distinguished.

IN the thirteenth quarterly report on the scientific work of the Lancashire and Western Sea-fisheries, Mr. J. Johnstone refers to experiments carried out at Conway in regard to the cleansing of mussels from sewage-pollution. By transplanting the mussels to pure water, about 90 per cent. of the sewage-bacteria was eliminated, from which it appears that it will be possible to render the polluted molluscs of the Conway estuary fit for human consumption at a comparatively small cost. In the fourteenth report Mr. Johnstone dwells on the measurements of plaice which have been made during the last two years, these relating to something like 100,000 individual fish. These lead to the provisional conclusion that, in spite of the enormous numbers of under-sized fish taken by this method, the 6-inch trawl-mesh is not harmful to the plaice-fishery. "The plaice are small and below the normal in 'condition' because they are so abundant. If they could be 'thinned out' by transplantation it might be of advantage to the fisheries in general to enforce the 7-inch mesh; but so long as they cannot be transplanted I do not think that the use of the larger mesh would lead to any improvement, and it would certainly diminish the takings of the inshore fishermen."

VARIOUS attempts have been made from time to time to interpret the phenomena of sex-determination in accordance with Mendelian principles. The problem is again attacked by Mr. Geoffrey Smith in the first of his "Studies in the Experimental Analysis of Sex," published in the *Quarterly Journal of Microscopical Science* for February. Some years ago this investigator was led to formulate a Mendelian interpretation of sex-inheritance as a result of his remark-

able observations on the parasitic castration of the crab *Inachus* by the degenerate barnacle *Sacculina*. Male crabs when infected by the parasite develop the secondary sexual characters of the female, and in certain circumstances ova may actually appear in the gonad. Female crabs in like case, however, do not develop male characteristics. Hence it was concluded that the male crab is a potential hermaphrodite, in other words, a heterozygote in which, under normal conditions, maleness is dominant. The female crabs, on the other hand, were regarded as pure recessives in respect of their femaleness. On these facts, amongst others, the author bases his "half-hybrid" theory of sex-inheritance, in accordance with which one sex is a heterozygote showing dominance of maleness or femaleness, while the other is a pure recessive homozygote. It appears that Prof. Bateson and Mr. Punnett two years later arrived independently at the same result in endeavouring to interpret Doncaster's remarkable breeding experiments on the currant moth, but in this case the female is the heterozygote and the male the homozygote. Mr. Smith also deals with the correlation between primary and secondary sexual characters, again largely as a result of his own observations on the parasitic castration of *Inachus*. He concludes that the development of the secondary sexual characters is not primarily dependent on the gonad, but that the development of both is dependent upon a common factor, which is supposed to be a hypothetical "sexual formative substance," an internal secretion, occurring in two varieties, male and female. The theory, however, is somewhat complicated by the necessity of taking into consideration the well-known effect produced by the gonad on the development of the secondary sexual characters, as shown by castration. Mr. Smith's views on the question approximate closely to those of Mr. Walter Heape.

A CURIOUS abnormality in a batch of crocus specimens is described in the *Gardeners' Chronicle* (February 26). Some of the thin scale leaves that envelop the bud had developed into white fleshy leaves, which grew nearly as high as a normal flower, while the enclosed foliage leaves and flowers were stunted. It is suggested that the sap had been diverted to the scale leaves as a result of forcing treatment.

THE treatment of felled trees with the view of reproduction by coppice shoots forms the subject of an article in the *Indian Forester* (December, 1909). In Europe it is usual to cut the stumps flush with the ground. When this method has been followed in India, at any rate in the case of the well-known sál tree, *Shorea robusta*, coppice shoots are in many cases not formed at all; it appears that, owing to contraction, the wood and bark separate, and the dormant buds are not rejuvenated; but if a few inches of the stump are left, coppice shoots are abundantly produced.

WITH regard to the ultimate reasons for the injurious effects produced in plants by frost, an instructive article appears as an editorial in the *Gardeners' Chronicle* (February 19). It has been shown that ice is first formed in the interspaces between the cells, with the result that water is withdrawn from the cell sap; continued formation of ice causes disruption of the tissues; but ice-formation is not regarded as the chief cause of injury. A new theory receiving the approval of competent authorities has been advanced by the Swedish botanist Lidfors. He examined a number of plants such as *Cerastium* and *Viola*, which, without any apparent means of protection, survive the severe winters of Sweden, and found that

during winter the starch in the leaves was replaced by sugar. He then falls back on experiments connected with the maintenance of proteins in the cell sap and protoplasm, by which it has been shown that if water be extracted from the cell the proteins pass out of solution, causing destruction of the cell; but if sugar is present the proteins will remain in solution until a much lower temperature is reached. This theory also affords a logical explanation of the disastrous effects of spring frosts.

THE official forecast for the wheat crop of South Australia is now published in the *Journal of Agriculture* for that colony, and is put at $11\frac{1}{2}$ bushels per acre. If this is realised it will be the second highest yield during the last twenty years. The average yield in 1893 was 7.5 bushels per acre; it fell steadily until 1896, when it was only 1.4 bushels, but then it rose slowly to 11.3 bushels in 1905 and has remained round about this figure since. The 1908 crop of 11.45 bushels was the highest on record. The yield for the United Kingdom in 1908 was 32.3 bushels.

It occasionally happens that milk which has stood at low temperature for twelve to twenty-four hours becomes so viscid that it can be drawn out into strings. The trouble is caused by a micro-organism, but as it is not very common no large number of investigations have yet been made. A case that arose in Rhode Island was fully investigated by Messrs. Cole and Hadley, the results being published as Bulletin 136 of the Rhode Island Agricultural Experiment Station. From the details given it appears that the organism resembles the *Bacillus lactis viscosus* described by Adametz and A. R. Ward, and belongs to the same group.

MR. H. T. FERRAR contributes further notes on the movements of subsoil waters in Egypt to the December (1909) number of the *Cairo Scientific Journal*. These deal specially with the variations of level observed in a number of experimental tube-wells specially set up in the province of Gharbia, in Lower Egypt, which indicate that the conditions in Lower Egypt are almost the reverse of those which obtain in Upper Egypt, the minor factors in the latter becoming the controlling factors in the former. A series of diagrams shows the relation of the Nile flood to the movements of water-table, with the modifications produced by such factors as the nature of the soil, seepage, and irrigation.

CAPTAIN TIXIER, of the Siam Indo-China Boundary Commission, contributes to *La Géographie* (xx., No. 6, p. 337) a valuable note on the orography of French Indo-China. The region may be described generally as a vast sandy plateau, uplifted towards the east and enclosed by four folds in parallel pairs perpendicular to each other. On the north the Tonkin and northern Annam fold runs north-west and south-east, with a parallel member, much less important, to the south, in the Cardamom range. At right angles to these, in a direction N. 25° E., are the Cape Varela-Poulo Condore chain and the great fold which appears to have rested its whole weight on the sand plateau, causing it to sink, and in balancing to rise to the east, the movement being accompanied by fracture in two directions parallel to the enclosing chains. The Gulf of Siam, with its almost uniform depth of 45 metres, is apparently a plain similar to that of Grand Lac and the Semoun.

WE have recently received an excerpt from the Bulletin of the Society of Historical and Natural Sciences of the Yonne (2 Semestre, 1908), consisting of a very useful

and laborious compilation by M. Ernest Blin of *Remarques météorologiques* made in various districts of that department between the fifteenth and eighteenth centuries. The notices are taken from the archives of various institutions and from provincial publications, and are arranged in chronological order, with references to the sources of origin, and furnish much information on the general character of the seasons and on conspicuous meteorological occurrences, floods, &c. Some interesting references are also made to the former practice of ringing church bells with the idea of dispersing hail and thunderstorms; this practice was still in vogue at Quarré-les-Tombes until the middle of the nineteenth century. The publication of this summary is due to a suggestion by M. E. Lauda, of the Austro-Hungarian Hydrographical Service, and recommended by the Meteorological Conference at Innsbruck in 1905, that all available historical documents of different States regarding abnormal weather phenomena should be collected and published.

IN November last Mr. J. W. Giltay and Prof. M. de Haas communicated to the Koninklijke Akademie van Wetenschappen te Amsterdam an interesting paper, a copy of which has just reached us, on the motion of the bridge of the violin. Various statements as to the nature of the movement have been made by writers on acoustics, such as Helmholtz, van Schaik, Apian-Bennewitz, Barton, Garret, and Pentzner, but, by ingenious experiments, Giltay and de Haas have conclusively proved that the motion of the bridge is in two directions, namely, (1) in its own plane about one of the feet and at right angles to the strings, and (2) at right angles to its plane, or transversely, that is, in the same direction as the strings. The sound of a violin must be attributed to three causes:—(a) a vibration imparted to the air by the string; (b) a vibration which the roof of the violin receives from the parallel swing of the bridge; and (c) a vibration communicated to the roof by the transverse vibration of the bridge. The (a) movement may be left out of account as being very weak, and the intensity and timbre of the note is determined by the parallel and transverse motions, and more especially by the latter. Each of these motions has its fundamental tone and associated partials, and the quality of the tone is modified when the intensity of one of the motions alters its partials, while it may leave the other motion unchanged or slightly changed. A "mute" damps the transverse motion of the bridge to a higher degree than the parallel motion, and the use of the mute does not weaken intensity so much as to alter quality.

THE February number of the Johns Hopkins University Circular consists mainly of notes from the physical laboratory of the University, edited by Prof. J. A. Ames. One of the most interesting of the notes is that of Mr. J. A. Anderson, on a method of testing screws intended for the most accurate work, such as the ruling of diffraction gratings. A nut which fits the screw accurately is cut in two by a plane through its centre perpendicular to its axis, and the two parts rotated through an angle of 180° , for example, with respect to each other. One of the plates of a Fabry and Perot interferometer is mounted on each half of the nut, and the motion of the interference fringes observed as the screw is rotated by hand at a convenient speed, the two parts of the nut being prevented from rotating with respect to each other. The method is more sensitive than that of the late Prof. Rowland, which consisted in ruling two sets of grating lines at a small angle to each other and observing the loci of the intersections of the two series of lines.

NO. 2108, VOL. 83]

THE *Electrician* for March 4 contains a short article by Dr. W. H. Eccles on the radiation from directive aërials in wireless telegraphy, in which the problem is treated by the exponential method, which has done so much to shorten the mathematical work in modern treatises on light. If the disturbance at the point of observation due to an aërial at a distance x is represented by $re^{i(u+a)}$, where u is a linear function of x and of the time, that from another aërial at a distance d from the former in a direction which makes an angle ϕ with the line joining the point of observation to the first aërial can be represented by a similar expression, with r and a omitted and u decreased by $2\pi d \cos \phi / \lambda$. The total disturbance at the point of observation due to the two aërials can then be represented by $e^{iu}(re^{ia} + e^{-i2\pi d \cos \phi / \lambda})$. The energy received is the square of the modulus of this, that is,

$$r^2 + 1 + 2r \cos(a + 2\pi d \cos \phi / \lambda).$$

This expression, plotted as a function of ϕ , gives the polar diagram of the directive system, the form of which depends greatly on the value of $2\pi d / \lambda$. The directions in which the radiation from the aërials is a maximum for a given value of a , the relative phase, are independent of r , the ratio of the amplitudes of the oscillations in the two aërials.

ALTHOUGH users of glass apparatus are familiar with the general appearance of the breaks which sometimes occur, no one has hitherto made a scientific study of their forms in relation to their causes. In the *Physikalische Zeitschrift* for February 15 there is a paper by Dr. L. Gabelli which remedies this omission. Breaks are classified as due either to external or to internal causes. The external causes may be localised, as in the case of a blow struck on the surface of the glass with a pointed or blunt object, or be distributed over the surface, as in the case of hydrostatic pressure. The author shows by means of numerous figures that in each case the break has characteristics which enable the cause to be assigned, and in the case of hollow vessels there is a difference between the effects due to the same cause applied within or without. Of breaks due to causes within the material, those which fall under unequal heating are most common, and, like the previous ones, have their own characteristics, which depend greatly on the distance of the heated point from the edge of the material. The author hopes that the technical importance of the subject will lead others to continue these investigations.

WE learn from a note in *Engineering* for March 18 that the Bureau Veritas International Register of Shipping will shortly issue a new edition of its rules. The new publication will be very comprehensive. No change has been made in the method of determining the scantling numerals, which remain as formerly, the basis being the sum of the breadth and depth, and the product of the length, breadth, and depth. For thickness of material, one-fiftieth of an inch has been adopted as a unit, instead of one-thirty-second as formerly. This will admit of ready comparison with the British standard decimal system on the one hand and with the metric system on the other.

MESSRS. WILLIAMS AND NORGATE will issue very shortly, in conjunction with Messrs. B. G. Teubner, of Leipzig, a volume compiled and edited by Yokshio Mikami, entitled "Mathematical Papers from the Far East."

MESSRS. WATTS AND CO. have issued for the Rationalist Press Association, Ltd., a cheap reprint of "The Nature and Origin of Living Matter," by Dr. H. Charlton Bastian, F.R.S. This edition has been revised and slightly

abbreviated, and its price in paper covers is 6d., or in cloth, with Dr. Bastian's portrait as frontispiece, 1s. net.

A CATALOGUE of rare and valuable books and autograph documents and letters has been issued by Mr. Bernard Quaritch, of Grafton Street, London, W. The catalogue runs to 336 pages, and contains full sections dealing with works on astronomy, mathematics and physics, topography, and other subjects likely to appeal to scientific readers.

A SEVENTH edition of "A Treatise on Ore and Stone Mining," by Sir Clement Le Neve Foster, F.R.S., has been published by Messrs. Charles Griffin and Co., Ltd. The work appeared first in 1894, when it was reviewed at length in *NATURE* (vol. l., p. 543) by the late Mr. Bennett H. Brough, who was afterwards responsible for the sixth edition, issued in 1905, and reviewed in *NATURE* of January 4, 1906 (vol. lxxiii., p. 220). The present issue has been revised by Prof. S. Herbert Cox, who has adhered to the original general scheme of the book. The price of the treatise is 28s. net.

THE issue of the *British Journal of Photography* for March 18 is the third of the special "colonial" numbers, in which that journal addresses itself specially to photographers and photographic dealers abroad. The enlarged text pages contain contributions on studio matters, including the first of a series of articles for the young professional portraitist on securing different effects of lighting. Mr. Edgar Clifton writes on the care of lenses in the tropics, Mr. Welborne Piper on the adjustments of the enlarging lantern, whilst a large proportion of the letterpress deals with recent introductions by photographic manufacturers.

OUR ASTRONOMICAL COLUMN.

THE SOLAR ECLIPSE OF 1912 APRIL 17.—In an article published in the *Revue générale des Sciences* for February 15, M. D. Savitch discusses at full length the circumstances of the solar eclipse of 1912 April 17.

The central line passes through Portugal, the Bay of Biscay, and across France to Belgium, its direction being north-east. It passes within ten miles of Paris. Only about three times a century is an eclipse total in France.

The magnitude of the eclipse along its central line is continually diminishing, and the character of the eclipse changes from total to annular. The point, however, where this change takes place can hardly be assigned with certainty, for it is largely displaced by a small change in the adopted semi-diameter of the moon; the difference of 1.18" between the values used by the *Nautical Almanac* and the *Connaissance des Temps* is sufficient to displace it by some hundred miles from a position out at sea to the neighbourhood of Paris.

In any case, totality is too short for the eclipse to be of much value in the usual way. Nor is there much reason to expect better results than usual from observations to determine the moon's position. No eclipse since 1715 plays a prominent part in determining the position of the moon, and the eclipse of 1715 and its predecessors are important because they are ancient rather than because they were accurately observed in the modern sense of the word accurate.

M. Savitch's article is clear, and illustrated by an excellent map.

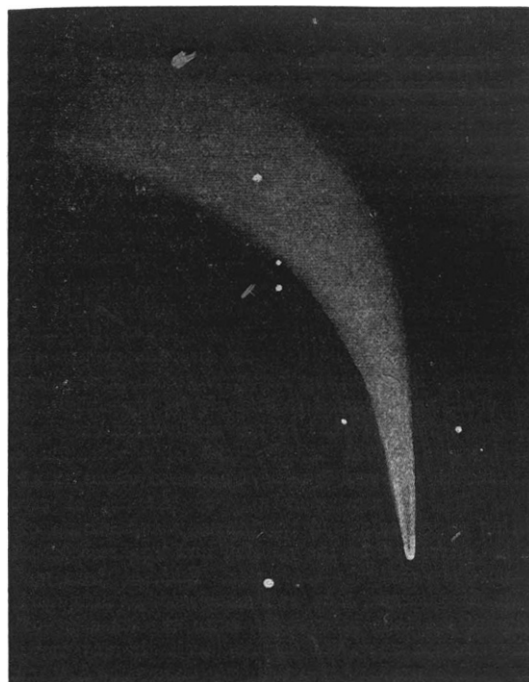
THE COMETS (1910a AND HALLEY'S).—A large number of observations of comet 1910a are published in No. 4392 of the *Astronomische Nachrichten*, including those made at Kodaikanal, Cambridge, Helwan, and Greenwich. Mr. Michie Smith reports a number of positions, several of which, it is interesting to note, are referred to positions of a sun-spot. On January 31 Mr. Evershed traced the tail to a distance of 27° from the head.

Herr Konkoly reports the presence of the three hydrocarbon bands, in the spectrum of the comet, on January 26, and states that the continuous spectrum was faint, whilst a fourth band was suspected.

NO. 2108, VOL. 83]

Dr. Kobold has carried his ephemeris back to the beginning of November, and shows that, although the comet was probably brighter than the sixth magnitude as early as December 1, it was apparently so near the sun as to render its discovery improbable. The ephemeris published in No. 4393 of the *Astronomische Nachrichten* indicates that the comet may become observable again about the first week in April as a morning star, but it will be faint and difficult. A note in the *Observatory* for March emphasises the necessity for such observations being made, if possible, because of their value in determining more rigidly the exact form of the orbit.

Dr. F. J. Allen kindly sends us a beautiful drawing of the comet depicting its form as he saw it on January 30 from the Mendip Hills; the observations were recorded in our article of February 10 (*NATURE*, No. 2102, p. 441). He directs especial attention to the pronounced curve of the tail towards its extremity, the direction beyond α Pegasi, the uppermost star shown, being nearly horizontal, and states that the comet as here shown is, relatively to the stars, too bright, while the head is perhaps



Comet 1910a. From a drawing by Dr. F. J. Allen.

a little too large; but the form and extent of the tail are as he saw it.

Dr. Allen, referring to the passage of the earth through the tail of Halley's comet on May 18, suggests that a well organised attempt should be made to collect some of the cometary dust which may then enter our atmosphere. It will be remembered that Prof. Turner, in his recent Royal Institution lecture, suggested that some such attempt should be made, by "bottling" some large quantities of the atmosphere. It is obvious that to have any hope of success the "bottling" would have to be done on a very large scale and under the most favourable and rigid conditions. Dr. Allen suggests a large chamber, carefully prepared and situated in a position where the air is usually very free from contamination, through which immense quantities of the atmosphere could be drawn and filtered. The filtering should be carried on before, during, and after May 18, in order that differential tests might be applied to determine the extra-terrestrial origin of the collected dust. As the cometary dust, and gas, may take days, or weeks, to diffuse sufficiently to reach the earth's surface, the experiment should be continued for some time after the critical date, thus affording opportunity to detect any differences in the collected matter.